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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/493,104	01/28/2000	Ken Yoshioka	503.38156X00	1799

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EXAMINER

OLSEN, ALLAN W

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 10/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/493,104

Applicant(s)

YOSHIOKA ET AL.

Examiner

Allan Olsen

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 July 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4, 6-8 and 12-28 is/are pending in the application.
- 4a) Of the above claim(s) 12 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-8 and 13-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 103

Claims 1-4 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,069,035 issued to O'Donnell et al. (hereinafter, O'Donnell) in view of U.S. Patent 5,952,245 issued to Torii et al. (hereinafter, Torii).

O'Donnell teaches a method of etching a layer comprising a transition metal, such as PERMALLOY™. O'Donnell's uses a plasma containing chlorine and argon to etch the metal layer while the temperature of the substrate support is maintained at 40°C. Following the chlorine etch step O'Donnell teaches a second step of rinsing the substrate with 90° C deionized water in order to remove chlorine residue from the etched substrate. O'Donnell teaches that the metal layer may be patterned by etching through a patterned photoresist mask. See: column 1, lines 10-20, 30-35, 62-65; column 5, 21-25; column 6, lines 34-35; column 5, line 66 – column 7, line 34.

O'Donnell does not teach drying a substrate on a hotplate after rinsing.

Torii teaches post plasma processing of metal alloys that comprises immediately rinsing the plasma etched metal with water and then immediately drying the substrate on a hot plate heated to 150° C. See: column 3, lines 47-50; column 13, lines 1-8; column 21, lines 5-10 and 25-29; column 22, lines 1-6 and 63-67; column 25, lines 4-16.

It would have been obvious to one skilled in the art to dry the substrate using a hot plate because Torii teaches that this increases resistance to corrosion.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over O'Donnell/Torii as applied to claim 1 above, and further in view of U.S. Patent 5,520,716 issued to Takagi et al. (hereinafter, Takagi).

As noted above, O'Donnell/Torii make obvious the limitations of claim 1. Additionally, it is noted that O'Donnell method is taught to have utility in the fabrication of magnetic heads. See column 1, lines 19-22 and column 7, lines 28-32.

O'Donnell does not teach that the PERMALLOYTM layer being etched is on a sintered Al₂O₃/TiC substrate.

Takagi teaches a sintered Al₂O₃/TiC substrate for magnetic heads.

It would have been obvious to one skilled in the art to use a sintered Al₂O₃/TiC substrate when applying O'Donnell's method to the fabrication of a magnetic head because the sintered Al₂O₃/TiC substrate of Takagi the fabrication of magnetic heads that have excellent smoothness. Also the head may be manufactured with high precision thereby proving heads with improved reliability.

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,282,776 issued to Otsuka et al. (hereinafter, Otsuka) in view of the O'Donnell/ Torii combination.

Otsuka teaches a method of fabricating a magnetic head comprising each of the component layers recited in the instant claims (i.e. an upper pole made from an a NiFe alloy, a seed layer, a gap layer and a NiFe alloy lower pole/shield layer). Otsuka's method includes etching the seed layer and then plasma etching the gap layer with a Cl or F containing gas. See column 15, line 61 - column 16, line 21.

Otsuka does not teach removing chlorine or fluorine residue with a liquid rinse.

The above noted teachings of O'Donnell/Torii are herein relied upon.

It would have been obvious to one skilled in the art to removing chlorine or fluorine residue from the structure of Otsuka by applying a liquid rinse as taught by O'Donnell because O'Donnell teaches that removing the chlorine and fluorine residues with a liquid rinse prevents corrosion. For the above stated reasons, it would have been obvious to one skilled in the art to conduct the post etch rinse and 200° C drying steps immediately following the plasma etch.

Claims 13, 15-23 and 25-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otsuka in view of O'Donnell/Torii as applied to claim 14 above and further in view of U.S. Patent 5,607,599 issued to Ichihara et al. (hereinafter, Ichihara).

Otsuka does not teach plasma etching the seed or shield layers with argon and chlorine.

Ichihara teaches etching NiFe alloy layers such as seed and shield layers with an argon and chlorine plasma. See column 4, lines 27-48

It would have been obvious to one skilled in the art to use the plasma etching method of Ichihara because Ichihara teaches that the use of Ar and BCl₃ allows one to obtain a high degree of etching selectivity between the various layers of the magnetic head as well as providing a means of fabricating the a magnetic head while maintaining a low processing temperature.

Response to Arguments

Applicant's arguments have been considered but are moot in view of the new grounds of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allan Olsen whose telephone number is 571-272-1441. The examiner can normally be reached on M-F 1-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Greg Mills can be reached on 571-272-1439. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read "Allan Olsen", written in a cursive style.

Allan Olsen
Primary Examiner
Art Unit 1763